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into a struggle between the older evolutionary and the newer developmental mechanical interpretations of morphology. It is difficult to see how the Bower sterilization theory can be overturned without carrying with it the whole scheme of Archeogoniate phylogeny which plant morphology owes to the classic work of Hofmeister. Nothing can be more apparent under accepted beliefs than that from *Oedogonium* sporophytes upward there is a progressive change from an entirely sporogenous plant body to one in which the great part of the sporogenous tissue is replaced by sterilized areas. It is, however, possible that both differentiation and the 'true metamorphosis' of Goebel have gone on together in the phylogenetic series. The experimental method would doubtless throw more light on the whole matter than the speculative phosphorescence which, up to the present, has been the chief illumination.

CONWAY MACMILLAN.

SCIENTIFIC NOTES AND NEWS.

AUSTRALASIAN ASSOCIATION FOR THE ADVANCEMENT OF SCIENCE.

THE Seventh Session of the above Association will be held in Sydney, from the 3rd to the 10th January, 1897, under the Presidency of A. Liversidge, M. A., F. R. S., Professor of Chemistry, University of Sydney.

The Presidents and Secretaries of the Sections are as follows:

Astronomy, Mathematics and Physics.—R. L. J. Ellery, C. M. G., F. R. S., Government Astronomer, Vict., President; R. Threlfall, M. A., Professor of Physics, and J. Arthur Pollock, B. Sc., Demonstrator in Physics, Sydney University, Secretaries.

Chemistry.—T. C. Cloud, A. R. S. M., F. G. S., Manager Wallaroo Copper Works, South Australia, President; W. M. Hamlet, F. C. S., F. I. C., Government Analyst, N. S. W., Secretary.

Geology and Mineralogy.—Captain F. W. Hutton, M. A., F. R. S., F. G. S., Director of Canterbury Museum and Lecturer in Geology, Christ Church, New Zealand, President; T. W. E. David, B. A., F. G. S., Professor of Geology and Physical Geography, Sydney University, and E. F. Pittman, A. R. S. M., F. G. S., L. S., Government Geologist and Lecturer in Mining, Sydney University, Secretaries.

Biology.—T. J. Parker, B. Sc., F. R. S., Professor of Biology, Otago University, Dunedin, New Zealand, President; W. A. Haswell, M. A., D. Sc., F. L. S., Professor of Biology, Sydney University, and J. H. Maiden, F. C. S., F. L. S., Curator, Technological Museum, Sydney, and Superintendent of Technical Education, N. S. W., Secretaries.

Geography.—H. S. W. Crummer, Secretary of the Royal Geographical Society of Australasia, N. S. W. Branch, Secretary.

Ethnology and Anthropology.—A. W. Howitt, F. G. S., Secretary for Mines, Vict., President; John Fraser, B. A., LL. D., Sydney, Secretary.

Economic Science and Agriculture.—R. M. Johnston, F. L. S., Government Statistician, Tasmania, President; Walter Scott, M. A., Professor of Greek, Sydney University, and F. B. Guthrie, F. C. S., Consulting Chemist to the Department of Agriculture, N. S. W., Secretaries.

Engineering and Architecture.—H. C. Stanley, M. I. C. E., Chief Engineer, Southern and Western Railway Lines, Queensland, President; J. W. Grimshaw, M. Inst. C. E., M. I. Mech. E., &c., Supervising Engineer, Harbors and Rivers Department, N. S. W., Secretary.

Sanitary Science and Hygiene.—Hon. Allan Campbell, M. L. C., L. R. C. O., South Australia, President; J. Ashburton Thompson, M. D., Chief Medical Inspector, Board of Health, N. S. W., Secretary.

Mental Science and Education.—John Shir-

ley, B. Sc., District Inspector of Schools, Brisbane, Queensland, President; Francis Anderson, M. A., Professor of Logic and Mental Philosophy, Sydney University, Secretary.

Communications and papers for the meeting, or inquiries, may be addressed to the Permanent Hon. Secretary, The Chemical Laboratory, The University, Sydney, N. S. W.

THE GEOLOGICAL SOCIETY OF AMERICA.

THE seventh summer meeting of this Society will be held Tuesday and Wednesday, August 27th and 28th, in the Art Museum, Springfield, Mass. The Council will meet Monday evening, August 26th, and the Society will be called to order on Tuesday morning at 10 o'clock. The preliminary list issued on July 30th includes papers by George M. Dawson and R. G. McConnell, C. H. Hitchcock, Warren Upham, H. L. Fairchild, B. K. Emerson, N. H. Darton, Arthur Hollick, George P. Merrill, Wm. H. Hobbs, A. Capen Gill, C. H. Gordon, J. F. Kemp, J. C. Branner, W. M. Davis, C. R. Van Hise. The excursions arranged include one of a week, beginning Tuesday, August 20th, through the crystalline area of western Massachusetts conducted by Professors B. K. Emerson and Wm. H. Hobbs, and three shorter excursions during the week of the meeting: (1) To the crystalline rocks west of the Connecticut River, under the direction of Prof. W. O. Crosby. (2) To the Triassic sandstones, including a visit to Mount Tom and Mount Holyoke, under the direction of Professor B. K. Emerson. (3) To Meriden and Southington, Conn., under the direction of Professors W. M. Davis and William North Rice.

THE WORK OF YALE OBSERVATORY.

IN the report for the year 1894-5 presented by the board of managers of Yale University to the President and Fellows,

Dr. Elkin states that he has continued and brought to what he hopes is a final close the series on the parallaxes of the first magnitude stars, and hopes to present the definitive results in the near future. The series on the parallaxes of the large proper motion stars, on which Dr. Chase has been mainly engaged, now comprises 99 stars, all but two of which have been observed at two parallax maximum epochs, in general on three nights. Measures of the Moon's diameter at the total eclipse of March 25th, last, and measures of Mercury referred to the Sun's limb at the transit on November 10th, last, were attempted, but in both cases the state of the sky permitted our obtaining only a small amount of results. The reductions of the *Coma Berenices* triangulation have been practically completed, and the work will shortly be ready for the press. The new equatorial mounting constructed by Warner & Swasey for carrying a number of cameras was used on three nights of the August meteor period, but only two meteor trails were found on the plates. The observatory has, however, twelve impressions of Perseid trails, and plates showing meteor trails have been sent by Professor Barnard and Professor Pickering, a discussion of which Dr. Elkin will shortly have ready for publication.

GENERAL.

It is hoped that Professor W. M. Davis will give one of the lectures on the part of the American Association complimentary to the citizens of Springfield. In this case his lecture would be upon the geographical development of the Connecticut Valley and would be illustrated by lantern pictures. The other lecture will probably be by Mr. Cornelius Van Brunt, on the Wild Flowers of the Connecticut Valley, illustrated by colored lantern pictures of the flowers and plants. The local committee contemplate offering a room free of

expense for the exhibition of scientific apparatus, specimens, etc. The railroads generally are making reductions on the plan of one rate and a third for the round trip, but unfortunately no reductions have as yet been made for railroads west of the Mississippi. Members from the West can, however, secure the reduction from points east of the Mississippi.

A CIRCULAR issued by Mr. William Kent, Vice President, and Prof. Harold S. Jacoby, Secretary of the Section of Mechanical Science and Engineering of the A. A. A. S., recommends that the papers read before the Section relate more especially to the application of scientific methods to the various engineering problems, while the more strictly technical subjects and the description of finished projects which appeal only to one branch of engineers belong rather to the different engineering societies. It has been suggested that short papers be presented giving information regarding the following questions: Have you any experimental data which either confirm or throw doubt upon formulas or constants hitherto generally received? Have you any data upon subjects hitherto considered doubtful, as, for example, the strength of unstayed surfaces? What subjects should engineering laboratories undertake to investigate, with a view to obtaining data which will be of general importance, and how would you propose to make such tests (including a description of the apparatus)? It is hoped that many brief resums of investigations or experiments relating to different subjects of interest to the Section may be offered for this meeting.

It was announced in the preliminary circular of the A. A. A. S. that the State Weather Service Association would meet in Springfield, Mass., but it is now found impracticable to meet with the A. A. A. S., on account of the difficulty in securing representation of the various State services,

three of the four preceding State Weather Service Conventions having been held in Eastern cities. Indianapolis, Ind., has therefore been selected for the place of meeting this year, and a large attendance of State Weather Service Directors is promised. The convention will be held October 15th and 16th.

THE Linnaean Society of New York has published the abstract of its proceedings for the year ending March 26, 1895. There were held during the year 14 meetings of the Society, at which the average attendance of members was seven and of visitors six. There were read 16 papers, of which nine related to ornithology and the remainder chiefly to mammology. The officers elected for the ensuing year are: President, J. A. Allen; Vice-President, Frank M. Chapman; Secretary, Walter W. Granger, and Treasurer, L. S. Foster. There are appended to the proceedings two papers, one by Dr. Juan Gunlach, entitled 'Notes on Cuban Mammals,' and one by Mr. W. L. Sherwood, on 'Salamanders found in the Vicinity of New York City, with Notes upon Extra-limital or Allied Species.'

PROFESSOR MENDELÉEFF will visit London during the present month, in connection with the work of making standards of Russian weights and measures.

IN England Mr. James Blyth, the well-known agriculturist, has received a baronetcy, and Mr. Herbert Gardner, President of the Board of Agriculture, has been made a peer.

A STATUE of M. Boussingault has been erected in the Court of the Conservatoire des Arts et Mètres in Paris, in which institution he was professor of agricultural chemistry for forty years.

THE *Medical Record* states that The Charcot Monument Fund now amounts to over 40,000 francs, nearly half of which sum has been contributed by foreigners.

It is proposed to commemorate the fiftieth anniversary of Professor Leuckart's doctorate. American students who have studied zoölogy under Professor Leuckart at Leipzig and who wish to contribute to the memorial—which will be a marble bust—should send subscriptions to Herrn Karl Graubner, Johannes Gasse 8, Leipzig.

SIR JOSEPH LISTER has been presented with a portrait of himself painted by Mr. Lorimer as a testimonial from his colleagues and pupils on his retirement from his chair in King's College Hospital. Speeches were made by Dr. W. S. Playfair, who presided, and Sir John Ericksen.

It is proposed to erect a statue in Copenhagen to the memory of Dr. Hans Wilhelm Meyer. Subscriptions may be sent to Mr. A. E. Cumberbatch, 80 Portland Place, London, W.

THE citizens of Geneva have petitioned that the statue of Carl Vogt, the work of M. de Niederhausen, be placed in the open air on the Promenade des Bastions instead of in The Vestibule of the University.

SIR WILLIAM FLOWER, Professor W. Ramsay and M. Sabatier have been elected correspondents of the French Academy.

The Photographic Times for August contains an admirably illustrated article on Astronomical Photography by Professor E. E. Barnard. A number of full-page reproductions are given of photographs with exposures as long as five hours.

WE quote from the *Lancet* the outlines of a plan having for its object the continuation of the Index Medicus: "The yearly cost of production is about £1,000 and it is proposed to raise this sum by 200 subscriptions of £5 each. The United States, it is estimated, will supply 120, Great Britain 60, and the Continent 20. We think, however, that Great Britain with all her learned societies might well subscribe £400 by herself. If £5 is too heavy a tax for one indi-

vidual to undertake, there are surely five medical men in every one of our large towns each of whom would subscribe £1, and so form a group which would receive a copy of the Index for their common use; while institutions and societies should have no hesitation in voting the required amount. Those who are willing to subscribe are requested to communicate with the Librarian, Royal Medical and Chirurgical Society, 20 Hanover Square, London, W."

At a recent meeting of the Michigan State Board of Health, the means of carrying out a new act of the Legislature passed at the instance of the board were discussed. This act requires the State Board of Health annually to send to public school superintendents and teachers throughout the State, printed data and statements which will enable teachers to teach their pupils the modes by which the dangerous communicable diseases are spread, and the best methods for the restriction and prevention of such diseases. This same law provides a fine or forfeiture in cases where any school board wilfully neglects to comply, and such neglect by any superintendent or teacher is sufficient cause for dismissal. There are 16,000 teachers in the State who will be required to spread sanitary information to their pupils. From a better and more general knowledge of diphtheria alone it is hoped that there will be a saving of life and money values equal to an amount much greater than the State now expends for the maintenance of the State Board of Health.

THE International Congress of Otology, held at Florence on September 23rd, will be attended by the leading aural surgeons of Europe and America. The last congress was held in Brussels in 1888.

PROFESSOR J. MARK BALDWIN, of Princeton, is coöperating in the preparation of the new French *Dictionnaire de Physiologie*, of which Professor Ch. Richet is the general

editor. Among the more important topics assigned to Professor Baldwin are *Intelligence* and *Heredity*.

THE question whether a child is naturally moral or immoral will be taken up by Professor James Sully in *The Popular Science Monthly* for September. This article will be devoted to primitive egoism and altruism, and will show that many of a child's acts that seem perverse or cruel are explained when we try to look at things from the child's personal standpoint.

THE first number of the American Journal of Sociology has been issued from the press of the University of Chicago under the editorship of Professor Albion W. Small. The number opens with an editorial article entitled 'The Era of Sociology,' followed by an article on 'The Place of Sociology Among the Sciences' by Lester F. Ward. The other articles are contributed by members of the University of Chicago.

SIR JOHN TOMES, a distinguished dental surgeon and writer on dental anatomy, died at Caterham, England, on July 29th. He was born at Weston-on-Avon in 1815. In addition to a large number of scientific papers he published in 1848 a 'Dental Physiology and Surgery' and in 1859 'A System of Dental Surgery.' In its latest edition the latter work is regarded in England as the standard text-book on the subject.

JOSEPH DERENBOURG, professor of oriental languages at the École Pratique, died at Paris on August 5th in his 84th year.

DR. GEORGE STEVENS, professor of English language and literature in the University of Copenhagen, died in Copenhagen on August 9th at the age of 82 years. He is known for his writings on history, folklore, linguistics and runology.

DR. VON GNEIST, professor of jurisprudence in the University of Berlin, died on July 21st, at the age of 79.

CORRESPONDENCE.

CAUSES OF THE GULF STREAM.

I AM convinced that one of the most important functions of such a journal as SCIENCE is the friendly criticism of articles whether appearing in its own pages or in those of other journals. Much harm is done by allowing to go unchallenged even slight inaccuracies in scientific statements. Permit me then to draw attention to some such inaccuracies in our issue of July 26th.

1. In Mr. R. Meade Bache's excellent article on the 'Causes of the Gulf Stream,' which I have read with the greatest interest and satisfaction, on page 89, 2d column, in speaking of these causes the writer says: "One of these, the centrifugal force of the earth's rotation, *draws the water as a submarine flow* from the poles to the equator." And again on page 92 he criticises Carpenter for omitting 'this agency of rotation.' Now, to say the least, this is an inaccurate mode of statement. For on the equilibrium theory, which he is sustaining, the only force which determines the exchange between poles and equator is difference of density. Rotation cannot *generate*, but only *deflect* a current already generated by some other cause. Centrifugal force determines the form of equilibrium, but does not disturb the equilibrium, and therefore cannot generate a current.

2. Again, on pp. 92 and 93, he says: "Both the Northern connecting current and the Southern connecting current run for the greater portion of their course *due east*, and therefore the direction of their courses is not, for that portion of their journey, influenced (deflected) by the rotation of the earth." Here we have again the very common but wholly false idea that deflection by rotation takes place only in bodies moving northward or southward. The fact is, the deflection is a function of latitude, but wholly *independent of the direction of motion*.